# 2009 Mobile Source Emissions Reduction Grant Cover Sheet

Project Title: Clean and Green Local Fuel

Project Coordinator: Maggie Ullman

Organization/Business Name: City of Asheville

Organization Type: Local Government

Mailing Address: P.O. Box 7148

City: Asheville County: Buncombe Zip: 28801

Telephone: 828.271.6141 FAX: 828.259.5832

Email: mullman@ashevillenc.gov

Alternate Contact Name: Mark Combs

Alternate Contact Telephone: 828.259.5939 Alternate Contact E-mail: mcombs@ashevillenc.gov

Amount Requested: $ 60,000

Amount of Matching Funds: *Cash* $ *In-kind* $ 843,000

Project Summary:

These funds would pay for the annual incremental cost for the entire City of Asheville diesel fleet to switch to using a biodiesel 5% blend instead of continuing to use ultra low sulfur diesel.

Margaret C. Ullman Date: 4-30-09

**Signature of Authorized Representative** (Signature certifies authority to represent this organization in this application. Unsigned applications cannot be accepted.) Attach this page to the front of your proposal.

# City of Asheville Goes 100% Biodiesel

## 1.0 Introduction

The City of Asheville (pop. 68,294) is the hub of a 408,436 population metropolitan area and the largest city in the 23 counties of Western North Carolina that include a total population of 1,015,268. The City is located at the intersection of two major Interstates (40 and 26) as well as major regional highways. Asheville is the primary venue for healthcare and professional services in the 13 western-most counties in region as well as serving as the political and social center.

A second economic driver is tourism. The region is known for the rugged topography of the Great Smokey Mountains and the Blue Ridge Mountains that include the most visited National Park in the country. Asheville's Art Deco downtown, the nationally known Biltmore House, and numerous other tourist venues draw over over 500,000 persons per year. Despite its reputation for beauty and for healthful living, public health issues in recent years increased due to air quality problems associated with growth of population, energy demands, sprawl, and vehicle use. In response, the City of Asheville has become Western North Carolina's leader in implementing progressive policies to reduce emissions, improve air quality, and address climate change.

## 1.1 Project Description

This proposed project will continue the City's progressive efforts as a leader in North Carolina to *improve energy efficiency and public health.* In this request*, we are seeking to funds to enhance our existing diesel fuel budget to pay for the incremental cost of 5% biodiesel (B5) blend fuel for all of our diesel vehicles and machines.* The City of Asheville Fleet consists of over 700 on and off road vehicles, 437 of which currently use ultra low sulfur diesel (ULSD). This project would enable the city to purchase at least half a million gallons of B5 over the next year for city fleet operations. In additional, the City of Asheville serves as a regional supplier to other entities for diesel, CNG and gasoline, including Mission Hospital (the largest employer in Buncombe County), Asheville Transit, and others, increasing their B5 usage as well.

In support of this project the City of Asheville will pay the share of the fuel costs that equal the market rate for traditional diesel, supplementing any additional costs with the grant to reach the total cost of B5. The fuel will be purchased in tank batches equaling 8,600 gallons with low bid biodiesel price determining the fuel supplier.

## 1.2 City of Asheville Project Staff

David Foster, Street Superintendent/Fleet Manager, City of Asheville. David has 20 years of experience in project management, construction administration, and fleet maintenance. His ability to manage and administer grant can be attested to through his successful completion of a Federal TEA 21 Enhancement Grant totaling $432,000. His Bachelors Degree in Business Management Mars Hill College demonstrates his skills in management and operations that compliments his technical skills.

Maggie Ullman, Energy Coordinator, City of Asheville. Maggie's background includes a BS in Environmental Policy and Management and 5 years of sustainability project implementation and management in both consulting firms and city management.

## 1.2 Degree of Public Support and Previous Environmental Projects

The City of Asheville has received a series of grants that are directly responsive to the evaluation of past performance. They represent significant proposals that were reviewed on a competitive basis and were (1) successfully managed and completed and (2) resulted in complete and timely reports including final technical reports in all cases. Those grants and their documentation are described below:

- *NCDENR Mobile Source Emissions Reduction Grant* ($400,000) In 2003, the City created the region's first publically accessible fast-fill CNG station in downtown Asheville. The grant required tracking of construction, cost evaluation, and assurance of safe operations. In addition, the City has actively promoted use of NGVs by joining with Mission St. Joseph's, WNC Regional Air Quality Agency, University of North Carolina at Asheville, and the Chamber of Commerce to initiate an alternative fuel vehicle (AFV) program for their respective fleets.
- *NCDENR Mobile Source Emissions Reduction Grant* ($12,000) In 2005 for the purchase of one GEM electric vehicle used in downtown police pursuit.
- *NCDENR Mobile Source Emissions Reduction Grant* ($40,000) In 2008, The City was awarded to retrofit a public works refuse hauler to use compressed natural gas.

In addition to the numerous grants earned the City of Asheville demonstrates a steady long term commitment to emissions reduction:

- Beginning in 1999, the City has collaborated with other local governments to reduce fleet emissions through outreach programs and technology sharing.
- In 2004, the City saw progressive use of alternative fuel and technology as a primary venue for showcasing the City's leadership-by-example and adopted a vehicle replacement policy that directly evaluated alternative fuel vehicles (AFVs).
- In 2005, the City's AFV Five-Year Plan created programs in vehicle down-sizing, idling policy, fuel reduction goals, and employee car pooling programs.
- In 2006, the City formed a -Sustainable Advisory Committee on Energy and the Environment that spearheaded the city adopting LEED building standards.
- In 2007, the City committed to reducing greenhouse gas emissions by 2% each year (from a baseline of 2001-2002) toward a goal of 80%.
- In 2008, the City's Transit Division was selected as one of ten cities in the national to participate in an Environmental Management System pilot project using Federal Transit Administration Funds to document transit operations processes using ISO 14001.
- In 2008, the City was the first winner of the *National NGV Achievement Award* from the Clean Vehicle Education Foundation (CVEF) and NGVAmerica which recognizes outstanding contributes to the advancement of natural gas as a vehicular fuel.
- In 2008, the City was the first winner of the annual *N.C. State Energy Office "Public Fleet Award" for excellent in improving energy efficiency.*

## 2.0 Quantifiable Reductions

| | PM | HC | CO | NOx | SO2 | CO2 | Total |
|---|---|---|---|---|---|---|---|
| Lifetime Tons Reduced tons | -0.09 | -0.13 | -1.03 | 0.20 | -0.06 | -222.29 | -223.39 |

* Results are from The National Biodiesel Board

For a sample calculation including inputs and result table, see the appendix.

### 3.0 Unquantifiable Benefits

Public Health: Through the reduction of harmful diesel emissions the City of Asheville will positively impact the air quality of the entire region. Environment North Carolina research confirms that air pollution caused by unhealthy levels of particulate matter, ozone, sulfates, and hydrocarbons results in about 3,000 premature deaths in North Carolina annually. While Buncombe County is not currently designated non-attainment for any National Ambient Air Quality Standard (NAAQS), it is near non-attainment for both ozone and $PM_{2.5}$. Buncombe County is within 4% of the standard for ozone. The Buncombe County area and surrounding region are also heavily impacted by atmospheric haze. Data collected from local $PM_{2.5}$ speciation monitors show that *sulfates and hydrocarbons are the largest contributors to haze in the region. Both are generally formed as the result of combusting fuels such as diesel and gasoline.* This haze obscures mountain views and threatens the tourism industry, which is vital to the area. Under certain weather conditions, the mountainous terrain leads to inversions that trap air pollution close to the ground. Studies have shown that some of the worst air quality conditions occur when locally generated pollution exacerbates these stagnant air conditions.
Implementing the use of B5 for the entire City of Asheville diesel fleet will reduce 223 tons of air pollution in one short year contributing to the State's efforts to reduce risk to public heath.

Economic Recovery: The project will aid in preserving jobs and promoting economic recovery through economic development of the regional biodiesel production industry as well as directly reducing local government expenses and by reducing health care costs, two of the segments of the economy that are most severely impacted by current economic conditions in Western North Carolina.

### 4.0 Budget

| Provider | Tasks/Equipment | DAQ Cost | City Costs | TOTAL |
|---|---|---|---|---|
| NC DAQ | Incremental Cost of B5 fuel | $60,000 | | $60,000 |
| City of Asheville | Primary cost of B5 fuel | | $843,000 | $843,000 |
| | | | | $903,000 |

There is no additional staff time needed to implement this grant above any beyond existing duties as they apply.

### 5.0 Cost Effectiveness

| DAQ Cost of Reduction | Total Tons Reduced | Cost Effectiveness (DAQ $/ ton reduced) |
|---|---|---|
| $60,000 | 223.39 | $269.05 per ton |

*Cost Effectiveness is DAQ $/Ton reduced

Cost effectiveness is $269.05 /tons of air pollution reduced.

**6.0 Permanence of Benefits**

The permanence of benefits from the planned project lies in the commitment from the City Council to be a leader in the community regarding green house gas emissions reduction including the use of AFVs. In addition, the emissions reductions from the entire city diesel fleet using B5 will have a permanent impact on the air quality and health of the region's citizens, natural habitat and visitors.

**7.0 Timetable**

Upon receipt of award the City of Asheville will commence purchasing B5 instead of ULDS and continue to do so for the duration of one fiscal year. The B5 product is readily available in Western North Carolina and can therefore be immediately folded into fleet operations purchasing practices.

**8.0 Evaluation of Project Success**

- B5 fuel will be purchased instead of ULSD for the duration of one year. The minimum estimated amount of fuel purchased approximates 550,000 gallons. This fuel will be purchased through the Fleet Division where invoices and reports of fuel usage will be maintain and tracked over the duration of the fiscal year.
- Public and staff awareness of this project will be managed through the City of Asheville Office of Sustainability. Concurrently the Office of Sustainability will track emissions results from this project through the City's annual green house gas emissions reporting procedures.
- City of Asheville diesel fleet emissions will be reduced by a total of 223 tons of green house gas emissions (detailed above)
- The project has a cost effectiveness of $269.05 per ton of total pollutants reduced (DAQ $ funded/ tons reduced) based on one years purchase of B5 fuel.
- Cleaning and greening the entire City of Asheville diesel fleet will assist the State in its endeavor to improve the ambient air quality in the area.
- Cleaning and greening the entire City of Asheville diesel fleet will assist the American Recovery and Reinvestment Act through stimulating the regional biodiesel economy.

**9.0 Appendix: Table of Contents**

• Letters of support from WNC Regional Air Quality Agency
• Example of calculation of emissions from the National Biodiesel Board emissions calculator

**Western North Carolina Regional Air Quality Agency**

**David A. Brigman, Director**

**Serving Buncombe County and the City of Asheville**

April 20, 2009

Ms. Maggie Ullman
The Sustainability Office
City of Asheville
P.O. Box 7148
Asheville, NC 28802

Dear Ms. Ullman:

I am pleased to offer my support for the proposal that you are planning to submit to the North Carolina Division of Air Quality under the NC Diesel Emissions-Economic Recovery grant for reducing emissions from the City's diesel vehicles by utilizing biodiesel. As you know, diesel emissions of fine particulate matter contribute significantly to fine particulate matter levels in our air. This pollutant is a problem here in our area, as is regional haze which is related to fine particles. Fine particulates cause various public health problems, and regional haze is a threat to our tourism industry.

While newer diesel vehicles are equipped with pollution control devices, there is much to be gained by the use of alternative cleaner burning fuels in the existing fleet. In addition to the benefits of decreasing fine particle pollution, utilizing biodiesel will reduce emissions of hazardous air pollutants, and City personnel's exposure to pollution.

Please let me know if WNC Air Quality may be of further assistance with this environmentally beneficial project.

Sincerely,

David A. Brigman

David A. Brigman
Director

**49 Mount Carmel Road Asheville, NC 28806**
**Telephone: (828) 250-6777 Fax: (828) 255-5226 Web Address: www.wncairquality.org**
**E-Mail: wncair@buncombecounty.org**

**The information in this model provides average changes in the pounds of emissions reductions based off of EPA sources. Results for a particular engine type and model year may vary.**

Total Fuel Usage: 551896 Do **NOT** use commas! (i.e. enter 300000 and not 300,000)

Enter % biodiesel in blend: 5 *For example, for **B20**, enter **20***

Calculate

| Average Change | PM | HC | CO | NOx | SO2 | CO2 |
|---|---|---|---|---|---|---|
| **Percent Reductions** | -3.14 | -5.44 | -3.23 | 0.49 | -5.00 | -3.92 |
| **Pounds of emission reductions** | -185.08 | -251.16 | -2,060.40 | 407.35 | -121.69 | -444,571.82 |

**Note on $CO_2$ reductions:**
Biodiesel provides a life cycle emissions reduction of 78% compared to petrodiesel. When carbon (with Molecular weight of 12) and hydrogen based fuel is burned (whether that is in an engine or otherwise) it combines with oxygen (molecular weight of 16) to make $CO_2$ and water ($H_20$). So, $CO_2$ (weight 44) is more than 3 times the weight of carbon (12).

However, that is only part of the explanation. Most people don't realize that almost all the material given off by any vehicle is $CO_2$ and water—the regulated emissions are only a very small fraction of the gases coming out the back of a tailpipe. For example, if the particulates coming out of the back of an engines measure 0.1 grams, the $CO_2$ would measure around 650 grams. So when you combine these factors, and the fact that biodiesel takes up $CO_2$ when it is produced and provides a 78% life cycle reduction in $CO_2$, that is why the $CO_2$ reductions for biodiesel are so large.